NON-PUBLIC?: N

ACCESSION #: 8903230353

LICENSEE EVENT REPORT (LER)

FACILITY NAME: Virgil C. Summer Nuclear Station PAGE: 1 OF 5

DOCKET NUMBER: 05000395

TITLE: Reactor Trip Due to Personnel Error

EVENT DATE: 07/26/88 LER #: 88-009-01 REPORT DATE: 03/16/89

OPERATING MODE: 1 POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION 50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:

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Supervisor, Regulatory Compliance TELEPHONE: 803-345-4042

COMPONENT FAILURE DESCRIPTION:

CAUSE: SYSTEM: COMPONENT: MANUFACTURER:

REPORTABLE TO NPRDS: N

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

On July 26, 1988, at 0928 hours, a reactor trip occurred while personnel were testing the "B" train solid state protection system actuation logic and master relay. Personnel in the control room were instructed to close the "B" reactor trip breaker. When the control board switch was rotated to the close position, "A" reactor trip breaker and "B" bypass reactor trip breaker opened causing a reactor trip from the "A" train solid state protection channel.

The event was similar to the reactor trip reported in LER 88-007, dated July 1, 1988, and LER 88-007, Revision 1, dated March 16, 1989. The cause of the event was attributed to he lack of adherence to procedure changes which had been implemented as a result of the previous trip.

The following corrective actions have been identified to preclude recurrence:

1. Procedures were changed to ensure the reactor trip breaker is closed using the main control board switch prior to plant startup.

- 2. Procedures now require individuals to perform closure manipulations of the breaker locally while at power.
- 3. Training was provided to applicable individuals to ensure the operation of the control room switch was understood.
- 4. A new precautionary label was placed at the reactor trip breaker switch on the main control board.
- 5. I&C personnel have been instructed in the importance of procedure adherence.

END OF ABSTRACT

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PLANT IDENTIFICATION

Westinghouse - Pressurized Water Reactor

EQUIPMENT IDENTIFICATION

Reactor Protection System EIIS-JP

IDENTIFICATION OF EVENT

Reactor trip on "A" train solid state protection due to personnel error.

EVENT DATE

July 26, 1988 at 0928 hours

REPORT DATE

March 16, 1989

CONDITION PRIOR TO EVENT

Reactor Power 100% - Mode 1

"B" train solid state protection system in test while performing routine surveillance testing.

DESCRIPTION OF EVENT

On July 26, 1988 at 0928 hours, operations and maintenance personnel were in the

process of performing Surveillance Test Procedure (STP) 345.074. This procedure tests the "B" train solid state protection system actuation logic and master relay. The "B" train reactor trip breaker had previously been racked out for testing. This configuration relies on the "A" reactor trip breaker and the "B" bypass reactor trip breaker for reactor protection. After the "B" main reactor trip breaker had been cycled satisfactorily in the test position, it was racked into place. Since the last plant trip occurred while performing the same STP (Reference LER 88-007, Revision 1), an I&C procedure change had been approved which instructed personnel at this step of the procedure to have the "B" reactor trip breaker closed locally at the breaker. When I&C called the control room, they requested that the "B" breaker be closed, but did not specifically indicate that it be closed locally. Control room personnel were cognizant of the previous reactor trip; however, they had been informed that the trip resulted from improper actuation of the reactor trip breaker switch causing some switch contacts to not

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be picked up. Control room personnel were uninformed of the I&C procedure changes, but were aware of the need to properly operate the switch by rotating it to the "full closed" position to ensure all contacts were picked up. After a discussion on proper switch manipulation, control room personnel closed the "B" reactor trip breaker from the main control board. When the control board switch was rotated to the close position, an interruption of the 48 volt undervoltage signal to the "A" reactor trip breaker and "B" bypass reactor trip breaker caused the breakers to open, resulting in a reactor trip from the "A" train solid state protection channel.

The signal interruption was caused by the momentary opening of a contact in the MCB switch as the switch travels from the after trip position to the close position. The output of each solid state protection system train is fed through the MCB reactor trip switch (contacts 5 and 7 in parallel for A train and contacts 15 and 17 in parallel for B train) to the undervoltage (UV) coils for the Reactor Trip Breakers (RTBs). Loss of voltage to the UV coil causes the RTB to trip open. If the switch is initially in the after trip position, then contact 5 (15) is open and contact 7 (17) is closed. As the switch is turned to close, contact 7 (17) opens before contact 5 (15) closes. This causes the UV coils to be momentarily de-energized resulting in the opening of the "A" RTB and "B" bypass RTB. Changes in testing due to verifying P-4 interlocks resulted in additional breaker manipulations while the plant was shutdown, and an auxiliary operator had been utilized locally to perform the manipulations. Since the RTBs are tripped using this switch as the plant is shutdown, the change in practice allowed the MCB switch to remain in the after trip position as the plant was restarted. Subsequent operation of the reactor trip switch to the closed position would therefore initiate a reactor trip.

CAUSE OF EVENT

The cause of this event was personnel error. Subsequent to the previous reactor trip (LER 88-007), maintenance procedure changes had been approved to require all breaker manipulations be made locally (at the breaker). During the performance of the STP, when I&C called the control room to request that the "B" breaker be closed, they did not specify to close the breaker locally. Operations personnel were not aware that the maintenance procedure required local closure and chose to use the MCB switch. Had the requirement to close the breaker locally been communicated to operations personnel, the trip would not have occurred.

ANALYSIS OF EVENT

The consequences of this event were minimal. The unit performance in the first minute following reactor trip was normal and as expected. Pressurizer pressure decreased to approximately 2000 psig and began recovering; RCS Tavg decreased to approximately 560 degrees F and began a slow decrease to the no load setpoint of 557 degrees F, and pressurizer level decreased to its no load setpoint of 25%. The "A" motor driven emergency feedwater (MDEFW) pump started automatically after the trip on "B" steam generator low-low level. The "B" MDEFW pump did not start at this time because the "B" train of solid state protection was in test. The "B" MDEFW pump did start automatically approximately 15 seconds after the trip when all three main feedwater pumps were manually tripped per

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procedure. The turbine driven emergency feedwater (TDEFW) pump started approximately 25 seconds after the trip due to lo-lo levels in all three steam generators, and operated approximately two minutes before being manually tripped by the operator.

The emergency feedwater (EFW) addition from all three EFW pumps caused the reactor coolant system (RCS) to cooldown to the lo-lo Tavg setpoint of 553 degrees F which subsequently isolated all condenser dump valves. The operators took manual action to reduce EFW flow, which combined with the disarming of the condenser dumps, resulted in an RCS heatup to approximately 564 degrees F. After approximately 15 minutes, this heatup increased steam pressure to the atmospheric relief setpoint and the steam generator power operated relief valves actuated for approximately 1.5 minutes. This reduced RCS temperature to 555 degrees F.

Because of minor primary to secondary leakage in the steam generators, the TDEFW pump and the power operated relief valve operations resulted in a release of 33.83 microcuries of Iodine-131 and 1.232 E+4 microcuries of Tritium. This equated to a total organ dose rate during the release of 24.74 mrem/year which

was 1.6% of the Technical Specification limit.

IMMEDIATE CORRECTIVE ACTION

Normal personnel response was initiated in acc rdance with Emergency Operating Procedure (EOP) 1.0, "Reactor Trip/Safety Injection Actuation," and EOP 1.1, "Reactor Trip Recovery."

A new label was placed on the main control board above the reactor trip breaker switch which reads as follows:

"Rx Trip Breaker Closures Shall Only Be Performed Locally At The Switch Gear"

Operations procedures were changed to direct Operations personnel not to close the reactor trip breakers from the control room.

A more explicit change in the "Precautions" section of the I&C procedures was made to indicate that the reactor trip breaker should be operated locally.

ADDITIONAL CORRECTIVE ACTION

Subsequent to the event, indepth testing and investigations into the operation of the switch were conducted. While the immediate corrective actions described above would prevent a subsequent trip from occurring, upon determination of the sequence of events surrounding the reactor trip, the following corrective actions were initiated to preclude recurrence:

1. STP-345.039 was changed to have operators close the reactor trip breakers from the MCB switch at the completion of testing performed while the plant is shutdown.

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Note: STP-345.039 is the surveillance procedure that closes the reactor trip breakers during startup.

- 2. General Operating Procedures for plant startup were changed to instruct Operations personnel to close the reactor trip breakers from the MCB switch just prior to startup.
- 3. Operations individuals were instructed to not close the reactor trip breakers from the MCB switch (i.e., instructions are to perform all closures locally) while the plant is at power.

- 4. Surveillance test procedures were changed to required only local reactor trip breaker operation when the plant is at power.
- 5. Training was provided to applicable individuals to ensure the operation of the MCB switch was understood.
- 6. The label on the MCB above the reactor trip breaker switch was changed to read: "Use switch to close breaker per STP-345.039 only. Take the switch to the full travel position when closing breakers."
- 7. I&C personnel were instructed in the importance of procedure adherence.

PRIOR OCCURRENCES

Reference LER 88-007 dated July 1, 1988, and LER 88-007, Revision 1 dated March 16, 1989.

ATTACHMENT 1 TO 8903230353 PAGE 1 OF 1

10CFR50.73

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March 16, 1989

Document Control Desk U. S. Nuclear Regulatory Commission Washington, DC 20555

Subject: Virgil C. Summer Nuclear Station Docket No. 50/395 Operating License No. NPF-12 LER 88-009, Revision 1

Gentlemen:

Attached is Licensee Event Report No. 88-009, Revision 1, for the Virgil C. Summer Nuclear Station. This report is submitted pursuant to the requirements of 10CFR50.73(a)(2)(iv).

Should there be any questions, please call us at your convenience.

Very truly yours,

O. S. Bradham

AMM/OSB:lcd

Attachment

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